A Parasitic Species of Copidognathus (Acari: Halacaridae)

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Most members of the subfamily Halacarinae are known to be or considered predacious, feeding upon small Crustacea or other minute animals. The genus *Copidognathus* Trouessart, 1888, the largest of the entire family Halacaridae with nearly 125 known species, has no members with demonstrated parasitic habits. Consequently, it is of considerable interest to find one species of this genus in Hawaii which is definitely parasitic on a marine crustacean.

The species was found by Dr. Donald C. Matthews of the Department of Zoology and Entomology of the University of Hawaii during the course of investigations on *Parribacus antarcticus* (Lund) (Decapoda, Scyllaridae). The species apparently lives as a parasite on the gills of this crustacean, for it has been found there in all stages, including eggs, and in great numbers. The filaments of gills infested by this mite sometimes show necrotic spots apparently due to the feeding activities of the mite.

It might be supposed that this species would differ noticeably from others of the genus with more normal habits, but this does not seem to be the case. In virtually all respects it is a perfectly typical *Copidognathus*. The species is named for Dr. Matthews who discovered it and made the observations upon its parasitic habits.

Copidognathus matthewsi, new species

Male. Body 447 to 486 μ long, 272 to 318 μ wide, length/width = 1.47–1.67; average 460 by 305 μ, length/width = 1.59 (five specimens). Anterior dorsal plate uniformly covered with porose panels, elevated areas totally lacking; setae well anterior to middle of plate (fig. 2). Second pair of dorsal setae in very margin of ocular plate or just outside and contiguous with it; not lying free in membranous area (fig. 1). Ocular plate with two corneae, porose panels as on anterior dorsal plate. Third pair of dorsal setae in posterior dorsal plate, costae totally absent; porose panels as on anterior dorsal plate, uniformly distributed. Anterior epimeral, posterior epimeral, and genitoanal plates uniformly marked with porose panels like those on anterior

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dorsal plate, but these are somewhat more densely packed (fig. 14). Epimeral processes of coxae I and II absent. Third pair of setae widely removed from posterior margin of anterior epimeral plate. Posterior epimeral plate with the usual three pairs of ventral setae (third pair duplicated on right side of specimen drawn). Genitoanal plate with 13 to 17 (av. 15.6) perigenital setae on each side (seven specimens). Genital sclerites not pronounced (fig. 4); subgenital setae slender, smooth, third pair shorter than others (fig. 4). Anal papilla prominent.

Chelicerae (fig. 3) small, but normal for genus; palpi also typical (fig. 7). Rostral sulcus 0.70 to 0.74 as long as rostrum, first pair of long maxillary setae 0.18 to 0.27 of the length of the sulcus from the posterior end of the sulcus. Chaetotaxy of legs (except for parambulacral setae and bacillum) as follows:

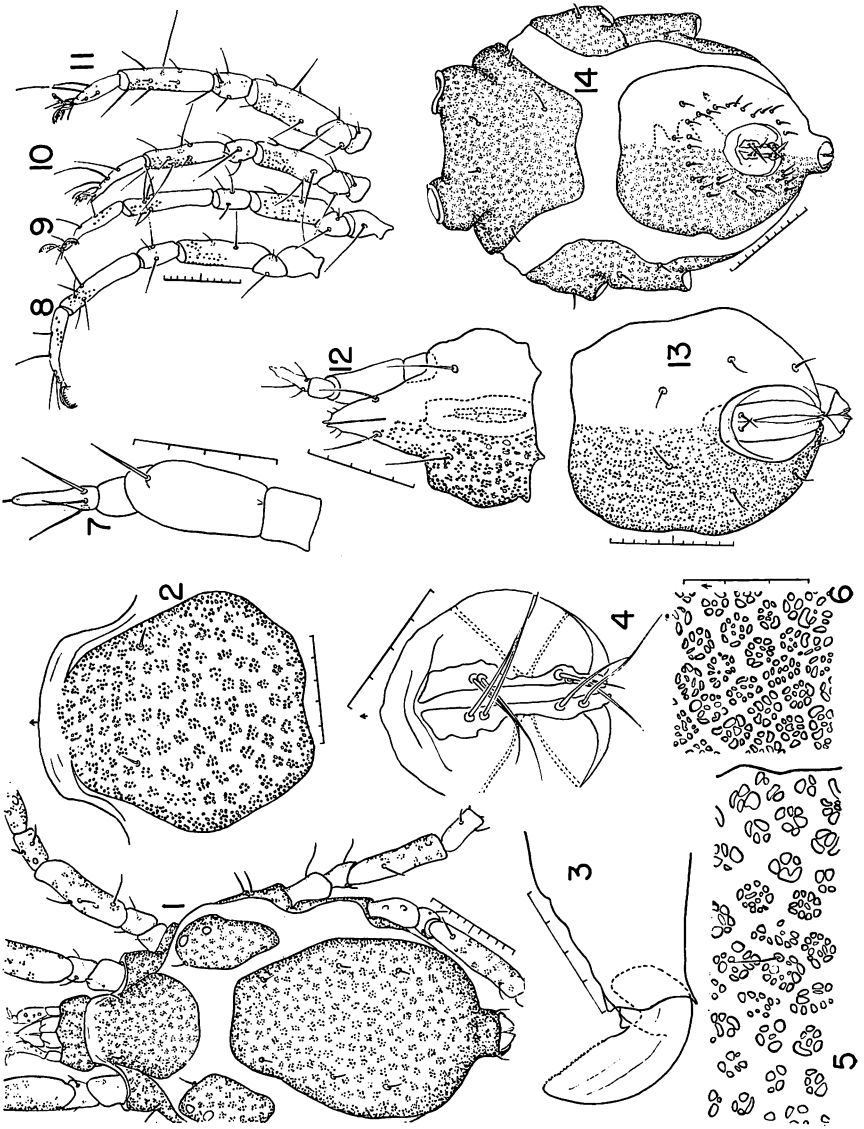
	tr	bf	tf	pa	ti	ta
I	1	2	5	4	7	6
II	1	2	5,*4*	4	7,6	3
III	1	2	2	3	5	4
IV	0	2	2	3	5	4

Telofemora III and IV with only two setae each; tarsi III and IV with four setae each. Bacillum present on tarsi I and II; parambulacral setae divaricate on tarsus I, *but single on II.* Medial setae of tibiae I and II only moderately heavier than other setae, and with only a few faint pectinations in distal portion. Distimedial seta of tibiae III and IV delicately bipectinate. Posterior parambulacral seta of tarsi III and IV long, bacilliform, anterior one short, spiniform. All claws with a long, well-formed pecten extending down axial margin of claw, around the outer aspect and a very short way down the outer margin, forming a J-shaped pecten and an apparent "accessory tooth." Median claw distinctly bidentate. All segments of all legs marked with porose panels which are best developed on the telofemur, diminishing in regularity and pore size toward the tarsus (figs. 8–11).

Female. Body 421 to 480 μ long, 259 to 311 μ wide, length/width 1.50–1.62; average 454 by 285 μ, length/width = 1.58 (five specimens). Essentially similar to male, except for characters of the genitoanal plate (fig. 13). Three pairs of perigenital setae as in other species of genus; a single pair of subgenital setae. Genital opening displaced from anterior margin of plate by a distance of 1.51–1.80 (av. 1.65) of length of genital opening from anterior margin of plate (five specimens).

Type locality: Kaneohe Bay, Oahu, Hawaii, May 29, 1952, Donald C. Matthews. Types in author's collection.

Parasitism is not common in the Halacaridae, there being only three genera in which parasitic species are known and for each of them a separate subfamily has been established by Viets. At least two of these are monotypic genera. *Halixodes chitonis* (Brucker, 1897) (subfamily Halixodinae Viets, 1927) is known only from the deutonymph found attached to the gills of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Acanthochiton porosus (Burron) (Mollusca, Amphineura) in New Zealand, while *Halixodes truncipes* (Chilton, 1883) is known only in the free living adult stage, and also from New Zealand. It is not impossible that these are the same species. *Enterohalacarus minutipalpus* Viets, 1938, (subfamily Enterohalacarinae Viets, 1938) is parasitic in the gut of sea urchins (*Plesiodiadema indicum* (Doderlein)) taken at depths of 430 meters in the Sulu Sea. Both females and nymphs were found in the gut. *Astacopsiphagus parasiticus* Viets, 1931, (subfamily Astacopsiphaginae Viets, 1931) has been found on a fresh water decapod, *Astacopsis serratus*, in Australia. Only nymphs have been found, attached to the gills by their chelicerae; the other stages are not yet known. All three genera in which parasitic species of Halacaridae have been described are quite unrelated, indicating that parasitism has shown up in at least three different parts of the family. The species described above provides no exception to this, but it is evidently a form in which the parasitic habit has arisen relatively recently, for with the exception of its habits, *Copidognathus matthewsi* is in all respects a typical *Copidognathus*. It would be interesting to see if the same species of mite were found in all parts of the range of this particular decapod. This would shed further light on just how recently the parasite has evolved.

This species keys out to *Copidognathus reticulatus* (Trouessart, 1894), and *C. latus* Viets, 1927, in Viets' key (1940), but differs from both in many respects. Of all the species described by the writer it resembles *Copidognathus acutus* Newell, 1947, most closely, but the differences are too many to justify a detailed comparison. Using the formula key to species of *Copidognathus* prepared by the writer (1951, pp. 3–4), *C. matthewsi* has the following diagnostic formula: 1a, 2a, 3b*a*, 4a, 5b, 6ab, 7ab, 8a*b*, 9a, 10b, 11a, 12a. The complete absence of costae and rosette pores, as well as its habitat, distinguish this species from all others which it otherwise superficially resembles.

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FIGS. 1–14. *Copidognathus matthewsi*, n. sp. 1. Dorsum, male. 2. Anterior dorsal plate, male. 3. Terminal portion of chelicera. 4. Genital opening, male. 5. Cuticular detail in posterior dorsal plate at level of 4th dorsal seta. 6. Cuticular detail in genitoanal plate, female. 7. Palp, male. 8. Leg IV, male. 9. Leg III, male. 10. Leg II, male. 11. Leg I, male. 12. Gnathosoma, male. 13. Genitoanal plate, female. 14. Venter, male.